

**Attachment 1**  
**Raw Avocado Nutrition Label**  
**derived by using data from**  
**1993-1997 California Avocado Commission (CAC)**

See Tables 1 + 2 for  
data recording error  
for Sample 25 for Calories

See Tables 4-9 for results  
of excluding two outliers -  
one for fat, one for fiber -  
from the statistical analysis

Table 1  
1993-1997 California Avocado Commission (CAC) Data  
for Avocados <sup>a</sup>  
Serving Size: 100 grams (raw)

SAMPLE <sup>b</sup>	LAB DATE	WATER (g)	ASH (g)	CALORIES		TOTAL	TOTAL		CARBO-HYDRATE (g)	DIETARY FIBER (g)	SUGARS (g)	PROTEIN (g)	VITAMIN A (IU)		VITAMIN C (mg)		CALCIUM (mg)	IRON (mg)
				CALORIES (kcal)	FROM FAT (kcal)		SATURATED FAT (g)	FAT (g)					VITAMIN A (IU)	VITAMIN C (mg)	VITAMIN C (mg)			
9	01/19/93	77.40	1.80	131.04	99.60	11.90	1.92	.	.	6.40	.	0.00	2.50	133.30	.	.	.	.
10	01/19/93	76.80	1.50	131.78	95.42	11.40	1.61	.	.	7.30	.	.	3.00	125.00	.	.	.	.
11	01/19/93	78.50	1.20	125.88	93.74	11.20	1.66	.	.	6.50	.	.	2.60	141.70	.	.	.	.
12	10/04/93	64.40	1.60	232.66	194.18	23.20	3.97	.	.	9.10	.	0.20	1.70	100.00	.	.	.	.
13	10/05/93	66.80	2.10	209.12	171.59	20.50	2.82	.	.	8.00	.	.	2.60	166.70	.	.	.	.
14	10/19/93	68.80	1.50	193.09	152.33	18.20	2.57	.	.	8.80	.	.	2.70	116.70	.	.	.	.
15	04/28/94	70.60	1.40	183.75	146.48	17.50	2.32	8.17	618.00	8.30	.	2.20	.	10.60	15.00	0.531		
16	05/02/94	69.50	2.70	189.61	158.19	18.90	2.64	13.10	640.00	6.30	.	2.60	.	8.20	11.00	0.526		
17	05/06/94	79.60	2.20	111.26	81.19	9.70	1.28	17.00	691.00	6.30	.	2.20	.	9.60	7.53	0.652		
18	12/29/94	77.80	1.00	118.29	74.49	8.90	1.47	.	486.00	10.30	.	2.00	.	13.00	19.00	0.579		
19	01/03/95	75.00	1.40	140.72	98.77	11.80	1.94	32.70	607.00	9.60	.	2.20	.	9.00	9.86	0.610		
20	01/04/95	72.00	1.90	168.32	131.41	15.70	2.63	13.40	652.00	8.20	.	2.20	.	13.90	14.70	0.756		
21	05/09/96	66.80	1.80	198.25	150.66	18.00	2.43	10.40	614.00	10.70	9.10	2.70	.	7.20	11.20	0.778		
22	05/13/96	69.30	2.00	170.81	119.69	14.30	1.75	8.23	544.00	11.80	7.50	2.60	.	7.20	9.48	0.688		
23	05/15/96	67.60	2.80	184.21	137.27	16.40	2.18	10.70	624.00	10.80	4.30	2.40	.	9.20	10.30	0.496		
24	02/17/97	66.30	2.00	203.22	157.36	18.80	2.88	10.80	494.00	10.50	9.40	2.40	.	7.70	13.90	0.849		
25	02/19/97	73.50	1.30	63.29	128.06	15.30	2.06	5.80	508.00	8.20	7.20	1.70	.	8.70	16.00	0.562		
26	02/24/97	74.20	1.90	140.99	97.09	11.60	1.75	5.23	466.00	10.70	9.70	1.60	.	8.50	16.80	0.298		

<sup>a</sup> These 18 samples have been sent to the FDA in various submissions as the samples have been collected by the CAC since 1993. The submissions since 1993 have also included the four samples from the PMA submissions and the four samples from the 1991 CAC submission. But, the sampling design and composite size for the 18 samples collected since 1993 differs from the 1989-1990 PMA and 1991 CAC sampling design and composite sizes. Since these 18 samples have a different composite size and sampling methodology than the earlier PMA and CAC samples, statistical analyses were done by using these data independently of the 1989-1990 PMA data and 1990 CAC data.

<sup>b</sup> This sample number corresponds to the lot code found in the most recent CAC submission, an August 20, 1998 letter providing all samples (PMA and CAC) for avocados taken from 1989 to 1997.

<sup>c</sup> No sodium values were given for samples 9-17 in the CAC 1996 submission, Proposal to Develop a Database for Nutrition Labeling California Avocados. But, in an August 20, 1998 letter from CAC providing nutritional measurements for newer samples since their last submission in 1996, a sodium value of 0.0 milligrams was given for sample 18, and nonzero values were given for samples 15-17 and 19-26. Since it was uncertain of whether sodium was not measured or the measured sodium level was 0.0 for sample 18, Karen Duester from The Food Consulting Company was contacted on behalf of the CAC on March 24, 1999. In this telephone conversation, Ms. Duester indicated that the lab sheet for sample 18 could not be located. As Ms. Duester reviewed previous versions of the avocado data for various dates throughout the study, the sodium value for sample 18 was blank for some versions and was 0.0 milligrams for other versions. With this uncertainty, the sodium value for sample 18 was assumed not to be measured and was assumed missing in the statistical analyses.

Table 2  
1993-1997 California Avocado Commission (CAC) Data  
for Avocados<sup>a</sup>  
Serving Size: 30 grams (raw)

SAMPLE <sup>b</sup>	LAB DATE	WATER (g)	ASH (g)	CALORIES				TOTAL CARBOHYDRATE				DIETARY FIBER				VITAMIN A (IU)		VITAMIN C (mg)		CALCIUM (mg)		IRON (mg)	
				CALORIES (kcal)	FROM FAT (kcal)	TOTAL FAT (g)	SATURATED FAT (g)	SODIUM <sup>c</sup> (mg)	POTASSIUM (mg)	HYDRATE (g)	FIBER (g)	SUGARS (g)	PROTEIN (g)	A (IU)	C (mg)	CALCIUM (mg)	IRON (mg)						
9	1/19/93	23.22	0.54	39.31	29.88	3.57	0.58	.	.	1.92	.	0.00	0.75	39.99	.	.	.	.	.	.	.		
10	1/19/93	23.04	0.45	39.53	28.63	3.42	0.48	.	.	2.19	.	.	0.90	37.50	.	.	.	.	.	.	.		
11	1/19/93	23.55	0.36	37.76	28.12	3.36	0.50	.	.	1.95	.	.	0.78	42.51	.	.	.	.	.	.	.		
12	10/04/93	19.32	0.48	69.80	58.25	6.96	1.19	.	.	2.73	.	0.06	0.51	30.00	.	.	.	.	.	.	.		
13	10/05/93	20.04	0.63	62.74	51.48	6.15	0.85	.	.	2.40	.	.	0.78	50.01	.	.	.	.	.	.	.		
14	10/19/93	20.64	0.45	57.93	45.70	5.46	0.77	.	.	2.64	.	.	0.81	35.01	.	.	.	.	.	.	.		
15	4/28/94	21.18	0.42	55.13	43.94	5.25	0.70	2.45	185.40	2.49	.	0.66	.	3.18	4.50	0.159	.	.	.	.	.		
16	5/02/94	20.85	0.81	56.88	47.46	5.67	0.79	3.93	192.00	1.89	.	0.78	.	2.46	3.30	0.158	.	.	.	.	.		
17	5/06/94	23.88	0.66	33.38	24.36	2.91	0.38	5.10	207.30	1.89	.	0.66	.	2.88	2.26	0.196	.	.	.	.	.		
18	12/29/94	23.34	0.30	35.49	22.35	2.67	0.44	.	145.80	3.09	.	0.50	.	3.90	5.70	0.174	.	.	.	.	.		
19	1/03/95	22.50	0.42	42.22	29.63	3.54	0.58	9.81	182.10	2.88	.	0.66	.	2.70	2.96	0.183	.	.	.	.	.		
20	1/04/95	21.60	0.57	50.50	39.42	4.71	0.79	4.02	195.60	2.46	.	0.66	.	4.17	4.41	0.227	.	.	.	.	.		
21	5/09/96	20.04	0.54	59.48	45.20	5.40	0.73	3.12	184.20	3.21	2.73	0.81	.	2.16	3.36	0.233	.	.	.	.	.		
22	5/13/96	20.79	0.60	51.27	35.91	4.29	0.53	2.47	163.20	3.54	2.25	0.78	.	2.16	2.84	0.206	.	.	.	.	.		
23	5/15/96	20.28	0.84	55.26	41.18	4.92	0.65	3.21	187.20	3.24	1.29	0.72	.	2.76	3.09	0.149	.	.	.	.	.		
24	2/17/97	19.89	0.60	60.97	47.21	5.64	0.86	3.24	148.20	3.15	2.82	0.72	.	2.31	4.17	0.255	.	.	.	.	.		
25	2/19/97	22.05	0.39	18.99	38.42	4.59	0.62	1.74	152.40	2.46	2.16	0.51	.	2.61	4.80	0.169	.	.	.	.	.		
26	2/24/97	22.26	0.57	42.30	29.13	3.48	0.53	1.57	139.80	3.21	2.91	0.48	.	2.55	5.04	0.089	.	.	.	.	.		

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**Table 3**  
**1993-1997 CAC Data for Raw Avocados**  
**that were excluded from Statistical Analysis**  
**since value was screened as an outlier**  
**through the Grubb's Outlier Screening Method**  
**Serving Size: 30 grams (raw)**

Sample Number	Nutrient (Units)	Measured Value	Reason <sup>A</sup> (calc t > critical)
12	saturated fat	1.19	(2.706 > 2.650)
19	sodium	9.81	(2.689 > 2.360)

<sup>A</sup> The calculated T statistic exceeded the critical value for a 5% level of significance, resulting in the value/mean for this record being identified as an outlier and this record being excluded from the statistical analysis.

**Table 4**  
**Statistical Parameters for Avocados**  
**derived from**  
**1993-1997 California Avocado Commission (CAC) Data <sup>a</sup>**  
**Serving Size: 100 grams (raw)**

Nutrient(units)	Degrees of Freedom	Sample Size	Mean	Standard Deviation
ash (g)	17	18	1.7833333	0.4817248
water (g)	17	18	71.9388889	4.7976880
calories (kcal)	1716	1817	162.57160.9105556	42.9219215 31.262
calories from fat (kcal)	1716	1817	123.38127.0844444	33.9184790 30.405
total fat (g)	1716	1817	14.7215.1833333	4.0523414 3.632
saturated fat (g)	16	17	2.1123529	0.4930077
cholesterol (mg)	.	0	.	.
sodium (mg)	9	10	10.2830000	3.6137670
potassium (mg)	11	12	578.6666667	75.1100203
total carbohydrate (g)	17	18	8.7666667	1.7736635
dietary fiber (g)	84	85	8.5807.8666667	2.0264912 1.147
sugars (g)	1	2	0.1000000	0.1414214
protein (g)	17	18	2.3277778	0.3877621
vitamin A (IU)	5	6	130.5666667	22.7799620
vitamin C (mg)	11	12	9.4000000	2.1362669
calcium (mg)	11	12	12.8975000	3.4865302
iron (mg)	11	12	0.6104167	0.1481427

<sup>a</sup> These statistical estimates were derived from 1993-1997 California Avocado Commission (CAC) Data under the assumption of simple random sample unless otherwise specified.

**Table 5**  
**Statistical Parameters for Avocados**  
**derived from**  
**1993-1997 California Avocado Commission (CAC) Data <sup>a</sup>**  
**Serving Size: 30 grams (raw)**

Nutrient(units)	Degrees of Freedom	Sample Size	Mean	Standard Deviation
ash (g)	17	18	0.5350000	0.1445175
water (g)	17	18	21.5816667	1.4393064
calories (kcal)	17 16	18 17	48.71348.2731667	12.8765765 9.376
calories from fat (kcal)	17 16	18 17	36.94138.1253333	10.1755437 9.121
total fat (g)	17 16	18 17	4.4135 4.5550000	±.2157024 1.090
saturated fat (g)	16	17	0.6337059	0.1479023
cholesterol (mg)	.	0	.	.
sodium (mg)	9	10	3.0849000	1.0841301
potassium (mg)	11	12	173.6000000	22.5330061
total carbohydrate (g)	17	18	2.6300000	0.5320991
dietary fiber (g)	5 4	6 5	2.5714 2.3600000	0.6079474 0.344
sugars (g)	1	2	0.0300000	0.0424264
protein (g)	17	18	0.6983333	0.1163286
vitamin A (IU)	5	6	39.1700000	6.8339886
vitamin C (mg)	11	12	2.8200000	0.6408801
calcium (mg)	11	12	3.8692500	1.0459591
iron (mg)	11	12	0.1831250	0.0444428

<sup>a</sup> These statistical estimates were derived from 1993-1997 California Avocado Commission (CAC) Data under the assumption of simple random sample unless otherwise specified.

**Table 6**  
**Means, One-sided 95% Prediction Limits,**  
**and Resulting Label Values for Avocados derived from**  
**1993-1997 California Avocado Commission (CAC) Data**  
**Using a Composite Size of 12 Units <sup>a</sup>**  
**Serving Size: 30 grams (raw)**

Nutrient (units)	Mean	Mean (%DV)	95%	95%	Rounded	Label Value	Label Value (%DV)	Label Choice <sup>b</sup>
			Prediction Limit	Prediction Limit (%DV)				
ash (g)	0.535	.	.	.	.	.	.	.
water (g)	21.582	.	.	.	.	.	.	.
calories (kcal)						50.0		calc
calories from fat (kcal)	4.4135	6.790	6.3098	8.169	45.0			calc
total fat (g)	4.555	7.008	5.6065	8.625	58.0	48.0	48.0	pi
saturated fat (g)	0.634	3.169	0.7495	3.748	0.5	3.0	3.0	pi
cholesterol (mg)	.	.	.	.	.	.	.	.
sodium (mg)	3.085	0.129	4.3077	0.179	0.0	0.0	0.0	pi
potassium (mg)	173.600	4.960	164.3512	4.696	160.0	5.0	5.0	pi
total carbohydrate (g)	25.74	10.276	22.132	8.853	2.0	1.0	1.0	calc
dietary fiber (g)	2.360	9.440	4.2960	5.184	24.0	44.0	44.0	pi
sugars (g)	0.030	.	0.2984	.	0.0	.	.	pi
protein (g)	0.698	.	0.6130	.	1.0	.	.	pi
vitamin A (IU)	39.170	0.783	30.370	0.607	.	0.0	0.0	pi
vitamin C (mg)	2.820	4.700	2.028	3.379	.	4.0	4.0	pi
calcium (mg)	3.869	0.387	2.393	0.239	.	0.0	0.0	pi
iron (mg)	0.183	1.017	0.125	0.695	.	0.0	0.0	pi

<sup>a</sup> These label values were derived from 1993-1997 California Avocado Commission (CAC) data under the assumption of simple random sampling and with statistical methodology in the FDA Nutrition Labeling Manual unless otherwise specified. Since the actual composite size was 12 units, 12-unit composite samples were assumed when calculating the one-sided 95% prediction interval.

<sup>b</sup> Below is an explanation of the feasible choices for selecting a value for the nutrition label.

"mean" - the mean was statistically selected and rounded for the label.

"pi" - the one-sided 95% prediction interval was statistically selected and rounded for the label.

"calc" - the label value was manually calculated with proximate formulae and label values statistically derived for other nutrients.

**Table 7**  
**Calculation of Total Carbohydrate Nutrition Label Value**  
**for Avocado**  
**using proximate relationship,**  
**total carbohydrate = weight - protein - total fat - moisture - ash**  
**Serving Size: 30 grams (raw)**

weight (g)	30.000		
unrounded protein (g)	0.613		
unrounded total fat (g)	<del>5.3098</del> <del>5.607</del>		
moisture (g)	21.582		
ash (g)	0.535		
unrounded total carbohydrate label value (g) and corresponding %DV	-1.663 1.960	0.554%DV 0.653%DV	1%DV rounded label value
rounded total carbohydrate label value (g) and corresponding %DV	2.000	0.667%DV	1%DV rounded label value

**Table 8**  
**Calculation of Calories and Calories from Fat Nutrition Label Values**  
**for Avocado**  
**using unrounded label values and proximate relationships derived from**  
**1993-1997 California Avocado Commission (CAC) Data,**  
**calories = 3.36 x protein + 8.37 x total fat + 3.60 x total carbohydrate**  
**Calories from fat = 8.37 x total fat**  
**Serving Size: 30 grams (raw)**

	Protein (g)	Fat (g)	Total Carbohydrate (g)	Calorie Summation
Atwater Factors	3.36	8.37	3.60	
Value	0.613	<del>5.607</del> <del>5.3098</del>	<del>1.663</del> <del>1.960</del>	
Calories Per Component (kcal)	2.06	<del>46.93</del> <del>44.44</del>	<del>5.99</del> <del>7.06</del>	<del>54.98</del> <del>53.56</del>
Rounded Label Values (kcal)		45		50

**Table 9**  
**Comparison of the Current Values**  
**and Those Values Proposed in this Attachment**

NUTRIENTS	Avocados <sup>A</sup> Serving Size: 30 grams (raw)			
	AMOUNT	%DV	AMOUNT	%DV
calories	55 kcal		50 kcal	
calories from fat	45 kcal		45 kcal	
total fat	5 g	8%	5.8 g	8% 9%
saturated fat	1 g	5 %	0.5 g	3%
cholesterol	0 mg	0 %		
sodium	0 mg	0%	0 mg	0%
potassium	170 mg	5%	160 mg	5%
total carbohydrate	3 g	1%	2 g	1%
dietary fiber	3 g	12%	2.2 g	8% 4%
sugars	0 g			
protein	1 g		1 g	
vitamin A		0%		0%
vitamin C		4%		4%
calcium		0%		0%
iron		0%		0%

<sup>A</sup> Differences between the current values and those values proposed in this attachment result from the use of different data.

2. Avocado, California varieties, raw, 1/5 medium (30 g/1.1 oz)

	Amount	%DV	Notes	5.3098	53.56
Calories	50		(0.613)(3.36) + (1.664)(3.6) + (5.6065)(8.37) = 54.98, rounded to 50		
Calories from Fat	45		<sup>5.3098</sup> (5.6065)(8.37) = 46.93, rounded to 45		
Total Fat (g)	<del>5.4</del>	8% <sup>a</sup> 9%	CAC <sup>a</sup>		
Saturated Fat (g)	0.5	3%	CAC		
Cholesterol (mg)	0	0%	assumed zero		
Sodium (mg)	0	0%	CAC		
Potassium (mg)	160	5%	CAC		
Total Carbohydrate (g)	2	1%	CAC		
Dietary Fiber (g)	<del>2.4</del>	8% <sup>a</sup> 4%	CAC		
Sugars (g)	0		CAC		
Protein (g)	1		CAC		
Vitamin A (%)		0%	CAC		
Vitamin C (%)		4%	CAC		
Calcium (%)		0%	CAC		
Iron (%)		0%	CAC		

<sup>a</sup> Data submitted by the California Avocado Commission (CAC) and evaluated by FDA.



